EtherneTV®
MEDIA DISTRIBUTION SYSTEM

EtherneTV-STB
Set Top Box

STB v3.7.2d Admin Guide

VBrick ®
systems, inc.

FCC Notice

This equipment carries the CE mark and is UL listed in the U.S. and Canada. This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numerique de la Classe A respecte toutes les exigences do reglement dur le materiel brouilleur du Canada.

About VBrick Systems

Founded in 1997, VBrick Systems, an ISO 9001 certified vendor, is a privately held company that has enjoyed rapid growth by helping our customers successfully introduce mission critical video applications across their enterprise networks. Since our founding, VBrick has been setting the standard for quality, performance and innovation in the delivery of live and stored video over IP networks—LANs, WANs and the Internet. With thousands of video appliances installed world-wide, VBrick is the recognized leader in reliable, high-performance, easy-to-use networked video solutions.

VBrick is an active participant in the development of industry standards and continues to play an influential role in the Internet Streaming Media Alliance (ISMA), the MPEG Industry Forum, and Internet2. In 1998 VBrick invented and shipped the world's first MPEG Video Network Appliance designed to provide affordable DVD-quality video across the network. Since then, VBrick's video solutions have grown to include Video on Demand, Management, Security and Access Control, Scheduling, and Rich Media Integration. VBrick solutions are successfully supporting a broad variety of applications including distance learning and training, conferencing and remote office communications, security, process monitoring, traffic monitoring, business and news feeds to the desktop, webcasting, corporate communications, collaboration, command and control, and telemedicine. VBrick serves customers in education, government, healthcare, and financial services markets among others.

Contents

Preface

1. Installation

2. Configuration

3. Local Configuration

4. System Upgrade

5. Serial Port Passthrough

6. Using the Set Top Box

Index

Preface

VBrick's EthernetTV-STB Set Top Box is a leading-edge digital set top box that provides a low-cost standalone decoder for high-quality MPEG-1, MPEG-2, and MPEG-4 video assets. It's an ideal MPEG decoder for cost-sensitive installations that require large-scale deployment. The user-friendly set top box is controlled like a cable TV receiver using an IR remote control. It can be used to access live streams, to request stored content from a video-on-demand server, or to access the Web. The STB is a component in VBrick's EtherneTV Media Distribution System. Other key components include:

- **EtherneTV Portal Server** – The ETV Portal Server is a video portal, permitting end users to view live and on-demand MPEG-1, MPEG-2 and MPEG-4 and other streams on a PC, Macintosh, or set top box.
- **EtherneTV Video-on-Demand Servers** – Provides all standard video-on-demand (VoD) features including support for MPEG-1, MPEG-2, and MPEG-4.
- **VBrick Hardware Encoders/Decoders** – Rugged, reliable video appliances that can reside anywhere on your network to provide either distributed or high-density centralized encoding/decoding of MPEG-1, MPEG-2, and MPEG-4 video.

Organization

Installation – provides an overview of the EtherneTV Media Distribution System and instructions for initial STB setup and configuration.

Configuration – explains how to login and how to set customizable configuration parameters for your particular environment.

Local Configuration – explains how to modify the xml file used when the STB is configured for Local mode. In Local mode, the program listings are hard-coded in an XML file.

System Upgrade – explains how to download and install software when there is updated STB code available from VBrick.

Serial Port Passthrough – explains how to use the serial port to control external devices such as cameras or networked devices.

Using the Set Top Box – explains how to get started using the system. It explains how to navigate, how to use the interface, and other basic STB concepts.

Font Conventions

Arial bold is used to describe dialog boxes and menu choices, for example: **Start > All Programs > VBrick**

`Courier fixed-width font is used for code elements (C++, HTML) as well as filenames, directories, etc.`

`Bold Courier fixed-width font is used to indicate user input in keyboard commands, scripts, etc.`

Web addresses are displayed as hyperlinks in the format: http://www.VBrick.com

Italics are used to emphasize specific words or phrases.

Related Documents

The following documents describe key components in VBrick's EtherneTV solution.

- *EtherneTV-STB Quick Start Guide*
- *EtherneTV-STB Release Notes*
- *EtherneTV Portal Server User Guide*
- *EtherneTV Portal Server Admin Guide*
- *EtherneTV-NXG VOD Quick Start Guide*
- *EtherneTV-VOD W Quick Start Guide*
- *EtherneTV-VOD WM Quick Start Guide*
- *VB4000-5000-6000 Administrator Guide*

Chapter 1

Installation

Overview

EtherneTV Media Distribution System provides the ability to view live streams and stored assets directly on a television or monitor by using the EtherneTV-STB Set Top Box decoder. The EtherneTV Set Top Box is integrated with the EtherneTV Portal Server and the EtherneTV-NXG Video on Demand server to enable viewing of MPEG-1, MPEG-2 and MPEG-4 pre-recorded and live streams. The EtherneTV-STB can also be deployed as a standalone decoder without the need for an MCS. The STB can be configured to operate in one of three modes: **MCS**, **Local** (standalone), **Local-Fullscreen** (standalone). See <u>Start Mode</u> on page 10 for details.

When the installation of set top boxes includes an ETV Portal Server, the set top box is directed to the portal server for user control; the graphics and user interface reside on the ETV Portal Server. When the set top box is deployed independently of the portal server, it comes equipped (in local mode) with a user interface and internal graphics. The Set Top Box can be configured through a web browser on a PC in either **Local** mode or **MCS** mode.

Topics in this chapter

<u>Overview</u>

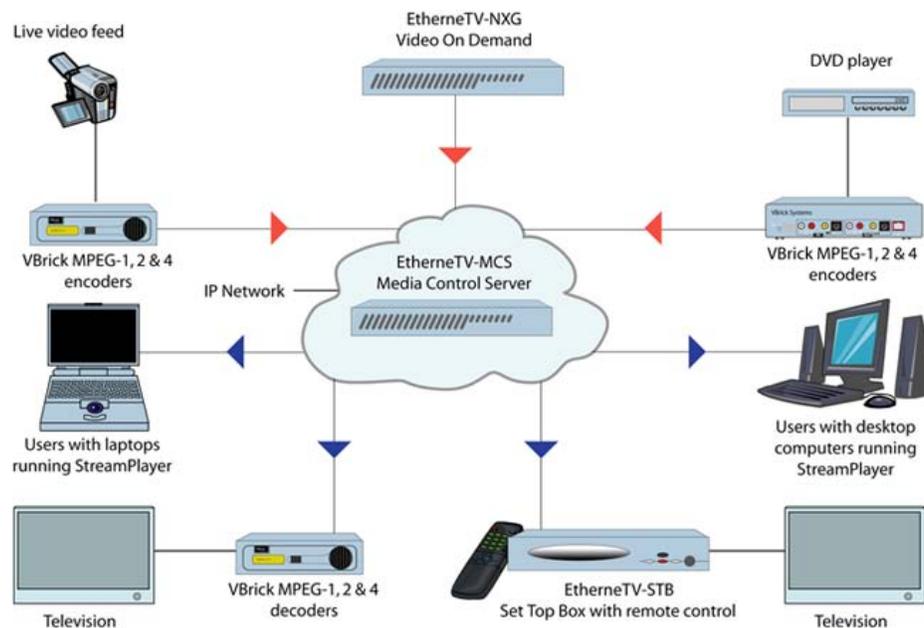<u>Using the Command Prompt</u>

<u>Initial Setup</u>

Figure 1. Ethernet-TV Media Distribution System

Using the Command Prompt

You can use a Command Prompt interface to quickly perform a variety of tasks related to STB configuration and connectivity using the pman configuration utility. There are three ways to open a Command Prompt interface on the STB. Use whatever method is comfortable and available. Once connected, they all work the same way. You can use:

- **Wireless keyboard** – Type **Ctrl-Alt-F1** to access the command prompt using the wireless keyboard (or a standard keyboard connected to the PS/2 port); type **Ctrl-Alt-F2** to exit.

- **Terminal emulation** – Connect a terminal (or a PC running terminal emulation software) to the serial port; refer to Serial Port Passthrough for pinout details. *Note that you cannot modify serial port parameters using this method.* VBrick recommends using Hyperterminal Private Edition 6.3 from Hilgraeve. (The configuration utility works poorly using the Hyperterminal application shipped with Windows.) When using Hyperterminal as a terminal emulation program, configure as follows:

  1. Open Hyperterminal and go to **File > Properties > Settings**.

  2. Set "Function, arrow, and control keys act as" to **Terminal Keys**.

  3. Set Emulation to **VT220** or **VT320**.

  4. Click the **Terminal Setup** button.

  5. Configure 25 rows by 80 columns.

  6. Set Terminal Mode to **Cursor keypad mode**.

  7. Click **OK** twice when done.

- **Telnet** – Connect to the STB from a PC running terminal emulation software. Vbrick recommends using PuTTY version 0.56 Windows-based freeware or the standard Telnet client shipped with RedHat Linux. (The configuration utility works poorly using the Telnet client shipped with Windows or with Hilgraeve Private Edition 6.3).

Table 1. Common Command Prompt Actions

Command Prompt Action	Type
Reboot the STB	reboot -f
View Network Configuration	ifconfig
Edit the Local UI Configuration File	cd /wfs/localui vi stbLocalUIData.xml :q! (to exit vi)
Test Network Connectivity	ping <ip_address>
Clear the Screen	clear (or **Ctrl-L**)
Change TV Resolution	setres (see PAL Configuration on page 6)
File Transfer	ftp
Get Current Software revision	tasteversion
Modify STB Configuration	pman – This program provides command line access to the same configuration parameters as the management interface described in the remainder of this document. See Using pman below for a brief overview.

Using pman

`pman` is an text-based configuration program that runs from the Unix shell on the set top box. Its functionality mirrors the web-based configuration tool and you can use `pman` to set or edit all STB configuration parameters. In a typical scenario, you use a keyboard (wireless or PS/2) to open a Unix shell and you launch `pman` from that shell. You can also run `pman` using terminal emulation or Telnet.

▼ To run `pman` using the wireless keyboard:

1. Type **Ctrl-Alt-F1** to access the Unix shell using the wireless keyboard (or a standard keyboard connected to the PS/2 port).

2. At the `VBrick-STB login:` prompt, enter the username and password (`root`, `admin`).

3. Then type **pman** to launch the text-based `pman` configuration utility.

4. Navigate using the arrow keys; select fields or apply changes using the **Enter** key.

5. Select `<...>` to exit to a higher level in the menu.

6. When done, type **Ctrl-Alt-F2** to exit.

Initial Setup

The VBrick EtherneTV Set Top Box is shipped with Audio/Video, S-Video, and power cables, and a handheld IR remote control unit. (An optional wireless keyboard is also available from VBrick.)

Table 2. STB Front Panel – Left to Right

Infrared Sensor	Above LEDs. Used for IR remote control and wireless keyboard.
Waiting	Blinks red during initial start-up.
Transfer	Blinks white when accessing flash memory.
Power	Steady green when power is applied.
On/Off	On/Off push button.

Table 3. STB Rear Panel – Left to Right

Power Plug	Connects to power cord.

VGA Port	Used to view video on a VGA monitor.
Serial Port	Used for <u>Serial Port Passthrough</u> or to open a command line window.
PCI Card Slot	Not used.
S-Video	Connect to standard TV.
Video	Composite video out.
Audio Left/Right	Audio out left and right.
USB Ports (2)	Connect USB mouse and/or keyboard.
SPDIF	Digital audio. Not supported.
LAN1	Connect to local area network.
LAN2	Not used.
PS/2	Connect PS/2 keyboard or mouse.

Connecting to the Network

▼   To connect the set top box to a TV and the network using the cables provided:

1. Attach the set top box video-out to a TV using the left (yellow) connector or the S-Video connector.
2. Connect the set-top box audio out (left and right) to a TV.
3. Connect the set-top box to the network using the LAN1 port.
4. Connect power cord to a power source.

Setting the IP Address

You need to know the IP address (or host name) in order to run the web-based STB Admin <u>Configuration</u> application. (If the host name is not available, either because it has not been configured or because it is configured for retrieval by DHCP and the DHCP server has not provided it, the STB will default to a host name based on its MAC address.) By default, the set top box is configured for DHCP (Dynamic Host Configuration Protocol) and will automatically retrieve an IP address from a DHCP server if present. If a DHCP server is not available, you can configure the set top box with a static IP address. The STB is set to a default IP address of `172.17.11.111` as a convenience. In most cases, this should be changed to avoid conflicts. You can find this IP address using a keyboard connected to the PS/2 port or by using a terminal connected to the serial port as explained below.

Note	By default, DHCP is used to retrieve a dynamic IP address for the STB. If you are not using a DHCP server, you must configure the STB to use a static IP address; the default static address is `172.17.11.111`.

▼   To determine the STB IP address:

1. If a DHCP server is *present*, go to <u>Finding the DHCP IP Address</u> to determine the IP address of your STB in DHCP mode.
2. If a DHCP server is *not present*, go to <u>Assigning a Static IP Address</u> to manually assign an IP address other than the default.

Finding the DHCP IP Address

▼   To determine the IP address of the set top box when configured using DHCP:

1. Connect a keyboard and TV monitor to the set top box and apply power. (Use the optional wireless keyboard or a PS/2 keyboard). Wait for the box to completely power up before continuing.

2. Press **Ctrl-Alt-F1** on the keyboard to open a command line window.

3. At the prompt type `ifconfig` and press **Enter**. This shows the IP address, the network interface configuration, and other parameters.

4. Reboot by powering the STB on and off using **Power** push button on front of unit.

Note   If DHCP is enabled and **DNS via DHCP** is configured to yes, the configured domain searchlist and domain name servers are ignored. The DHCP server must provide the IP address of the DNS server for host name resolution to work properly. If the DHCP server does not supply a default domain or domain searchlist, fully qualified domain names must be used wherever an IP address or domain name is configured (for example in the MCS Location, Receive Address, Local UI location, or home page location on the Video Setup configuration page).

Assigning a Static IP Address

▼   To assign a static IP address using a command line window:

1. Connect a keyboard and TV monitor to the set top box and apply power. (Use the optional wireless keyboard or a PS/2 keyboard). Wait for the box to completely power up before continuing.

2. Press **Ctrl-Alt-F1** to open a command line window.

3. To enter the setup program, type **pman** and press **Enter**.

4. Select **Parameters** (using the arrow keys and **Enter**).

5. Select **Network > Ethernet**.

6. Change **DHCP Enable** to **Static**

7. When prompted, enter the default (case sensitive) User name and Password: `root` and `admin`

8. Click **Enter** to reach **OK** and then click **Enter**.

9. Change **DNS via DHCP** to **No**.

10. Change **Hostname via DHCP** to **No**. For entries indicated with an asterisk (*), use the arrow keys to move the cursor to the correct entry and use the spacebar to select the new option.

11. Select IP address using the down arrow and the **Enter** key. Using the keyboard, enter the IP address obtained from your network administrator and press **Enter**.

12. Select and enter the **NetMask**, **Gateway** addresses, and **Hostname** using the same procedure as selecting the IP address above.

13. Leave the Ethernet interface **Mode** of operation at the default **Auto** (auto-negotiate). (Other options are selectable but in most networks you should only select a different option if necessary to interoperate with your network equipment.)

14. Enter the IP address of the Nameserver as follows:

    a. Select **Network** (using the down arrow and the **Enter** key).

b. Select **Network** again.

c. Select **Domain NameServer IP Addresses** and enter the Nameserver IP addresses. (If there is more than one, separate the entries with the pipe character (|), for example `172.16.1.11|172.16.1.10`.)

15. When done, use the up arrow key to reach <. . . > and select using the **Enter** key on each screen. Answer **Yes** when prompted to apply changes and **Exit** to return to the user prompt level. Wait until the changes are applied and the interface returns; otherwise the changes may be lost.

16. Reboot by powering the STB on and off using **Power** push button on front of unit.

PAL Configuration

The `setres` command than can be executed from the Linux shell. This command lets PAL users change the screen resolution. Although this command can be executed from the Command Prompt or from Telnet, it is designed to be used from the serial port since a PAL user without an NTSC or VGA monitor has no other choice if the STB IP address is unknown. The syntax of the `setres` command is:

```
setres pal <username> <password>
setres ntsc <username> <password>
```

Model Numbers

The STB model number is shown on a label attached to the bottom of the unit. The functionality in the following table is cumulative. The model at the bottom of the list inherits all features and functions from the previous model. Any firmware is compatible with any model; all models support MPEG-1, MPEG-2, and MPEG-4 streams.

Model Number	Enhancements
8000-0044-0000	Base model.
8000-0044-0001	Improved MPEG-1 quality.
8000-0044-0002	Serial port added.
8000-0044-0003	Closed caption support added.

Chapter 2

Configuration

Overview

The STB configuration application is used to change the default settings for the STB. Once the IP address is obtained through the Command Prompt interface (see <u>Setting the IP Address</u> on page 4), you can access the set top box by typing the IP address into the Address field of a web browser, such as Internet Explorer. When the first page is displayed, select **Log in** from the navigation bar at the top of the page.

Topics in this chapter

<u>Overview</u>

<u>Configuration</u>

Login

▼ To login to the set top box:

1. Enter the IP address of the STB in a browser and click **Log in** when the first page is displayed.
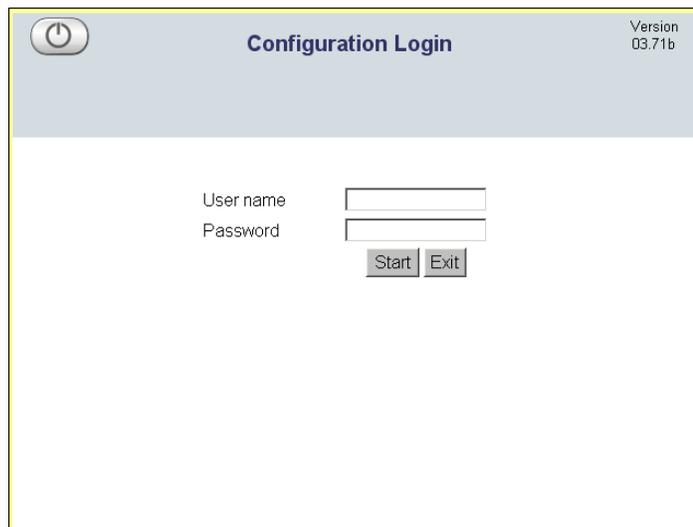
2. Enter the **User name** and **Password** and click **Start**. This displays the **Administration** window. This window is used to access all system parameters. Most commands described in this document are accessed via the **Configuration** button.

User name	Default User name: `root`. Lower case, case sensitive.
Password	Default Password: `admin`. Lower case, case sensitive.
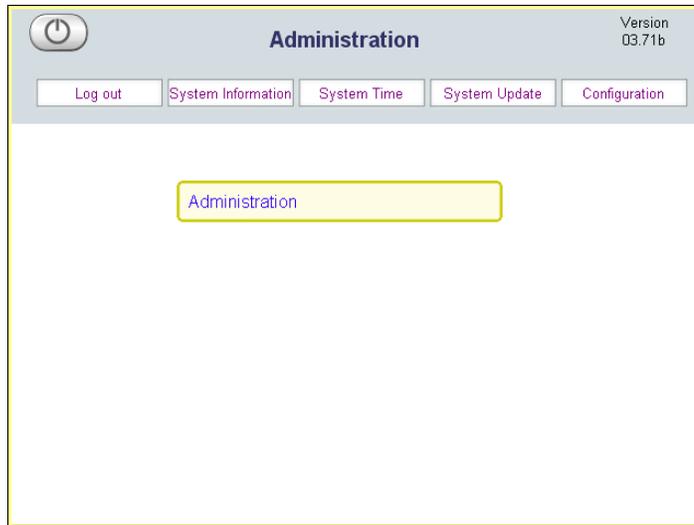
Logout	Exits the configuration application.
System Information	Provides system-level information including version number, networking configuration, and memory usage. Note that the version number is shown in the upper-right corner of each window.
System Time	Use to set system time.
System Update	Use to update the software. See System Upgrade on page 27.
Configuration	Use to set all configuration parameters described in this document.

Saving Changes

Once logged in you can navigate and change **Configuration** parameters as necessary. Each of the configuration screens has the same options at the top. When done, click **Apply** to save any changes you have made. Do not click **Apply** after each change.

Log out	Logs out the current user. You can log back in as a different user if necessary.
Apply	Saves any configuration changes.
Refresh	Refreshes the window with the last saved information.
Exit	Returns the Administration page from anywhere in the application.

Configuration

Once you are logged in, click **Configuration** to display the four sub-categories of configuration settings for the set top box. Note that the **VBrick_Host_Name** shown on the

following screens is a configurable option; see Network Settings on page 14 for more information.
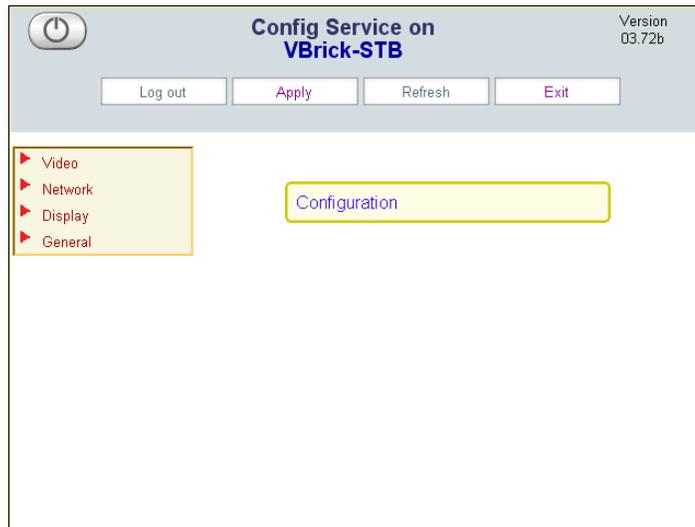
Video Settings	These settings generally relate to the video stream, for example Start Mode, MCS Location, Receive Address, etc.
Network Settings	These settings include Network, Ethernet, and Management SAP settings.
Display Settings	These settings let you adjust the resolution of your monitor.
General Settings	These settings include Serial Port, Security, System Update, etc.

Video Settings
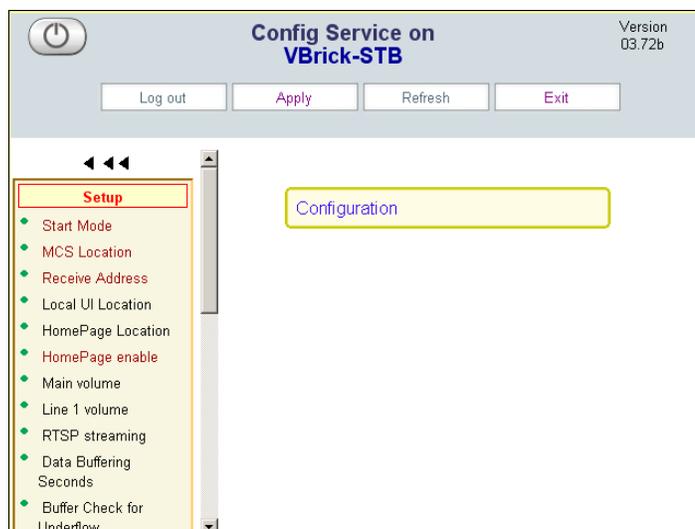
Start Mode

MCS Location

Receive Address

Local UI Location

Home Page Location/Home Page Enable

Main Volume/Line 1 Volume

RTSP Streaming

Data Buffering Seconds

Buffer Check for Underflow

Lowest Bitrate for Buffer Check

Audio Data Port/Video Data Port/CC Data Port

RTP Data Port

Proxy Type, HTTP Proxy Host and Port

Options Panel Login

Aux1–Aux8

Start Mode

The EtherneTV STB can operate in one of three modes described here. Use **MCS** mode if there is an ETV Portal Server (formerly MCS) installed on your network. Otherwise you must select **Local** or **Local-Full Screen** mode.

MCS	Use if the installation includes the EtherneTV Portal Server.
Local	Use if the installation does not include the EtherneTV Portal Server. If Local, the site administrator must configure the Program Guide. See Local Configuration on page 21 for more information.
Local-Fullscreen	Use if the desired operation is to set the unit to decode one channel and operate in full screen mode at boot up. *If you select Local-Fullscreen mode, you must also enter a Receive Address; see below.*

MCS Location

MCS Location	When the start mode is configured for MCS, this parameter determines the IP address of the ETV Portal Server that the STB will obtain its program listing information from. Enter the IP Address of the portal server. The format is `172.12.12.12`.

Receive Address

Receive Address	When the Start mode is configured for **Local-Fullscreen**, this parameter determines the IP address of the stream to be decoded. The choice of receive address/program info and stream type of the desired video must be entered here and must follow the syntax examples shown in Table 1, Receive Address Syntax. Note that you can use a hostname or numeric IP address wherever an `<ipaddr>` is called for if the hostname is entered in the local DNS server.

Table 1. Receive Address Syntax

Multicast MPEG-1	`RTSP@MULTICAST_MPEG1://group:port/`
Multicast MPEG-2	`RTSP@MULTICAST_MPEG2_TRANSPORT://group:port/`
Unicast or Multicast MPEG-4 with Remote SDP File	`http://<ipaddr>/<path_to_remote_file>`
Unicast or Multicast MPEG-4 with Local SDP File	`RTSP@ISMA_SDP_FILE:///wfs/<path_to_local_file>`, e.g. `RTSP@ISMA_SDP_FILE:///wfs/mpg/currentmp4.sdp` See <u>Local-Fullscreen Mode with MPEG-4 Multicast</u> for information on how to FTP the SDP file to the set top box.
Unicast MPEG-1	`RTSP@UNICAST_MPEG1://#dataPort=<port>`
Unicast MPEG-2	`RTSP@UNICAST_MPEG2_TRANSPORT://#dataPort=<port>`
RTSP MPEG-1 for Video on Demand (EtherneTV NXG only)	`RTSP@KASENNA_MPEG1://<ipaddr>/program`
RTSP MPEG-2 for Video on Demand (EtherneTV NXG only)	`RTSP@KASENNA_MPEG2_TRANSPORT://<ipaddr>/program`
RTSP MPEG-1 for Video on Demand (EtherneTV VoD-W only)	`RTSP@INFOVALUE_MPEG1://<ipaddr>/program`
RTSP MPEG-2 for Video on Demand (EtherneTV VoD-W only)	`RTSP@INFOVALUE_MPEG2_TRANSPORT://<ipaddr>/program`
RTSP MPEG-4 Internet Streaming Media Alliance (ISMA) (Live or VoD)(	`RTSP@ISMA://<ip addr>/program` (e.g. `RTSP@ISMA://172.22.117.2/vbrickvideo1` **--or--** `RTSP@ISMA://172.22.119.119/Complete-Movies/enterprogramname`) Video can be streamed over UDP or TCP. See <u>RTSP Streaming</u> on page 13 for options.

Local-Fullscreen Mode with MPEG-4 Multicast

Note	If necessary you can FTP the SDP file to the set top box as described here. However the recommended method is to retrieve the SDP file via HTTP.

To decode multicast MPEG-4 in Local-Fullscreen mode, you can put an SDP file on the set top box using the set top box internal FTP server as shown in the sample FTP session below.

▼ To decode multicast MPEG-4:

1. First, obtain an SDP file for the MPEG-4 multicast stream. When streaming from an MPEG-4 encoder, see the *VB4000-5000-6000 Administrator Guide* for information about SDP files.

2. Use an FTP client to place the SDP file on the set top box. A sample FTP session to use an set top box with the IP address of 172.22.117.70 is shown below. (Server prompts are shown in **bold**.)

```
C:\> ftp 172.22.117.70
User (172.22.117.70:(none)): root
331 Password required for root.
Password: admin
230 User root logged in
ftp> bin
200 Type set to I.
ftp> cd wfs/mpg
250 CWD command successful.
ftp> put vbs1d1.sdp
200 PORT command successful.
150 Opening BINARY mode data connection for vbs1d1.sdp
226 Transfer complete.
ftp: 739 bytes sent in 0.12 Seconds
ftp> bye
```

Local UI Location

Local UI Location	When the start mode is configured for Local, the STB will allow static listings and previews of multiple channels on the network. You can use this setting to create a custom user interface.

When the **Start Mode** is configured for Local, the STB will display static listings and previews of multiple channels on the network. These listing are configured in an xml file. The xml file must be modified for each network installation so that IP addresses, port numbers, encoder types and program listings correspond to actual network settings. This file is edited for local mode installations only and does not apply when operating in **MCS** or **Local-Full Screen** mode. For detailed examples of how to edit the xml file, go to <u>XML Configuration Examples</u> on page 23.

Home Page Location/Home Page Enable

Home Page Location/Enable	This parameter determines the location of the home page that is displayed when the WWW button is pressed on the IR remote control. When this option is disabled, the Home page will not be loaded when the WWW button is selected.

Main Volume/Line 1 Volume

In MCS mode, when the volume has been manually turned down using the remote (and the configured audio level is significantly higher), there will be a brief burst of higher volume when switching views between preview and full screen. Reduce the configured audio level to avoid abrupt changes in volume.

Main and Line 1 Volume	These parameters determine the initial volume level the STB will provide to the TV or monitor. Set both to same value. The volume can be changed using the IR remote control but will revert to the configured values at start-up.

RTSP Streaming

RTSP Streaming	MPEG-4 streams in Local-Fullscreen mode only. Choose the protocol for RTSP streaming. *If the source is a video-on-demand server, you must choose UDP.*
	• UDP – MPEG-4 RTSP streams will be sent over UDP. • Interleaved (TCP) – MPEG-4 RTSP streams will be sent over TCP on the RTSP port. (Also called "RTSP Interleaved".) • Automatic – An attempt will be made to play the stream over UDP. If this fails, TCP will be used.

Data Buffering Seconds

Data Buffering Seconds	MPEG-4 only. This setting will allow more data to be saved before it is displayed. This can be used in networks where there is a high amount of delay variation or congestion in the network backbone, and will 'smooth out' video when the network has not been optimized. This parameter should generally be left at the default value.

Buffer Check for Underflow

Buffer Check for Underflow.	If checked yes, a periodic check for buffer underflow will be made using the value in **Lowest Bitrate for Buffer Check** as a cutoff. Setting a small value for Lowest Bitrate may result in disruption to low bitrate MPEG-4 streams. This parameter should generally be left at the default value.

Lowest Bitrate for Buffer Check

Lowest Bitrate for Buffer Check	If **Buffer Check** is set to yes, and if video stream has bitrate greater than the value, a periodic check for underflow for MPEG-4 streams will be made. This parameter should generally be left at the default value.

Audio Data Port/Video Data Port/CC Data Port

Audio and Video Data Ports	Audio, Video, and CC Data Port settings default to 6970, 6972, and 6974 respectively. These are used to determine receive ports for data. This will affect MPEG4 streams requested via RTSP. This will be used only for MPEG-4 streams. The range is from 0 to 65534. *The data port must always be an even number.*

RTP Data Port

RTP Data Port	Set the data port number to use for RTP data. Default = 6970. 0 is random. This will be used only for MPEG-1 and MPEG-2 streams served by the VoD server. The range is from 0 to 65535.

Proxy Type, HTTP Proxy Host and Port

Not used.

Options Panel Login

Not used.

Aux1–Aux8

Not used.

Network Settings

Network

Ethernet

Management

Network

These options are used to change network-related settings. The FTP server is used to transfer files to the STB from a remote device such as a PC.

FTP Server User Name	Username used to log into the FTP server on the STB.
FTP Server Password	Password used to log into the FTP server on the STB.
FTP Home Directory	Home directory of the FTP server on the STB.
Domain Name Server IP Addresses	IP address (or addresses) of the DNS server. Separate multiple DNS servers with a pipe character, for example: `172.16.1.10|172.16.1.11`
Domain Searchlist	The list of domain names that will be searched when resolving host names. Separate multiple domains with a pipe character (|).

Ethernet

These options are used to enable or change the Ethernet settings on the STB. Some or all may have been previously configured earlier. See <u>Setting the IP Address</u> on page 4.

Network DHCP	To change to Static, select option
DNS via DHCP	When using DHCP: If the DNS settings should come from the DHCP server, check the box (for yes). If not, uncheck the box (for no).
Hostname via DHCP	When using DHCP: If the host name will come from the DHCP server check the box (for yes). If not, uncheck the box (for no).
VBrick Hostname	Enter a hostname if Hostname via DHCP is set to No or if DHCP enable is set to Static. If you enter an invalid host name, the STB will not start. If no host name is entered, it defaults to the MAC address. The following rules apply to host name: • must less than 19 characters. • first character must be a letter. • last character must be a letter or digit. • interior characters must be letters, digits, or hyphen. • no embedded spaces or special characters are allowed.
IP Address	If the IP address is static rather than set through DHCP, enter it here.
Subnet Mask	Set when using a static IP address.
Gateway IP Address	Set when using a static IP address.
Network Interface Speed-Type	Set the Ethernet interface to the desired speed and duplex of operation. Default is Auto (auto-negotiate) but 10Mbps and 100Mbps, half and full duplex options are selected if required. You should only select a different option if necessary to interoperate with your network equipment.

Management

The STB transmits Management SAPs for use by other VBrick devices and/or applications on the network such as VBDirectory or MCS. This menu configures the transmission of these management SAPs. These options are used to enable or change the management settings on the STB.

Group Name	STBs can be assigned to groups for more organized management. This is the group name that the STB is associated with (for example Finance).
Unit Number	This value represents the specific STB ID when it is part of a group (for example Finance, unit 33).
Transmit Enable	Enables transmission of the management SAP.
Retransmit Time	Determines how often (interval) the STB emits the management SAP.

Time to Live	Determines the number of hops that a SAP will travel before being discarded.
Type of Service	The value of the TOS bits in the IP header of the management SAP packets. This parameter can be used to implement quality of service within a network.
IP Address	Determines the unicast or multicast IP address that the SAP will be sent to.
Port	Determines the IP port that the SAP will be sent to.

Display Settings

General

Resolution

General

The options on this page (except for Splash Screen parameters) are not supported. A splash screen showing the VBrick logo is briefly displayed when you power-on the system or reboot. The **Splash Screen** parameter lets you replace the standard VBrick page with a customized page. Note that a custom splash screen must be in the .xpm graphics format used in Unix and cannot exceed 100 KB. Be sure to check the file size. ImageMagick is freeware available on the web that can be used to convert a .jpg file to an .xpm. You can download the Windows binary version of this application from http://sourceforge.net/project/showfiles.php?group_id=24099. After download, open a Command Prompt window and type:

```
convert mySplash.jpg mySplash.xpm
```

You can also use the `size` parameter to change the resolution of the .xpm file. For example:

```
convert -size 160x120 mySplash.jpg mySplash.xpm
```

Show Version	Choose whether the splash screen should show the version number.

Splash Screen	Choose the type of splash screen to display during startup: • Default – Use the default VBrick splash screen. • Custom – Use a custom splash screen. • None – Use a blank screen.
Location of Custom Splash Screen	The location of custom splash screen. The image should be in the .xpm file format and less than 320 x 240 pixels in size. Place the image in the `/wfs` folder on the set top box.

Resolution

These options are used to enable or change the display resolution settings on the STB.

Color Depth	Not used.
Decoder Video Format	Determines whether NTSC or PAL resolution is being used. Set to match your TV.

General Settings

Serial Port

Security

System

System Update

Language

Hardware

Serial Port

Using serial port passthrough, STBs can provide full duplex, end-to-end transparent passthrough of user data from an STB to a VBrick, or to other networked devices. The STB has one serial port that can be used for passthrough. The serial port operates at its configured baud rate (e.g. 115.2 to 300K bps). Some common applications include remote control of a

camera (pan-tilt-zoom), remote control of security doors, low speed data transport, or data collaboration between PCs.

Passthrough: Responder	If enabled, will be a Passthrough responder; else port will host a serial shell fixed at (9600, 8N1).
Passthrough: Baud Rate	Choose the Baud Rate for serial port when Passthrough is active. Default = 9600.
Passthrough: Stop Bits	Choose the number of Stop Bits for serial port when Passthrough is active. Default = 1.
Passthrough: Parity	Choose the Parity for serial port when Passthrough is active. Default = None.
Passthrough: RTS Control	Choose the RTS control method for the serial port when passthrough is active. Used to initiate an action when a signal is detected. See Serial Port Pinouts on page 38 for more information. • Force-Off (default) – Signal always off. • Force-On – Signal always on. • Automatic – Set to on when serial port passthrough is active; set to off when not active.
Passthrough: DTR Control	Choose the DTR control method for the serial port when passthrough is active. Used to initiate an action when a signal is detected. See Serial Port Pinouts on page 38 for more information. • Force-Off (default) – Signal always off. • Force-On – Signal always on. • Automatic – Set to on when serial port passthrough is active; set to off when not active.

Security

Root Password	Changes the password used to log into the STB when the username is `root`
User Password	Changes the password used to log into the STB when the username is `noroot`
Enable FTP Server	Check box to enable FTP server.
Enable Telnet Server	Check box to enable Telnet server.
Enable HTTP Server	Check box to enable HTTP server.
Enable Browsing	Check this parameter to allow access to external web pages and allow use of the STB as a web browser.

System

The STB can be configured to automatically reboot at a specified interval.

Watchdog Frequency	Default = 0 which means never reboot; 1 means reboot every day; 2 means reboot every second day, and so on. Watchdog Time is used in conjunction with Watchdog Frequency.
Watchdog Time	Choose time (on 24-hour clock) that this unit will restart.
Enable Gateway Validation	Specifies whether the network gateway should be validated at startup. Default = Enable.

System Update

These parameters are used to set system update options. See <u>System Upgrade</u> on page 27 for a description of this procedure.

FTP Server	The location of the external FTP server from which the STB will access system update files.
Relative Directory Path	Location of system update files on the external FTP server. For example, if system update files are located in /user/r370 and the home directory is /user, then enter r370 in this field.
FTP User	Username used to log into the external FTP server.
FTP Password	Password used to log into the external FTP server.
Update Proxy	Not used.
Update Proxy Port	Port used for the proxy server.
Always Full Updates	This option should always be checked. This option determines whether or not partial or full updates should be performed.
Auto Check for Update	This option should always be unchecked. It determines whether or not the STB should check for code updates at initial startup.
Run Post-Update Script	This option should always be unchecked.

Language

Not used. Do not change from factory defaults.

Hardware

The only user-selectable option on Hardware menu is **Mouse Type**. If you connect a USB mouse to the USB port on back of STB, you must change this setting to **USB** or the mouse will not work.

Local Configuration

Overview

When the **Start Mode** is configured for **Local**, the STB will display static listings and previews of multiple channels on the network. These listing are hard-coded in an xml file. *This xml file is used for Local mode installations only; it does not apply when operating in MCS mode or Local-Fullscreen mode.* (To select **Start Mode** in the web-based STB configuration application, go to **Configuration > Video > Setup > Start Mode**.) Examples of the local xml file that contains local mode program information are shown on the following pages. This xml file will need to be modified for each network installation so that IP addresses, port numbers, encoder types and program listings correspond to actual network settings available onsite.

When the **Start Mode** is set to **Local**, the STB user interface is defined by the local administrator. The default location of the local user interface is on the STB in `/wfs/localUI/stbLocalUITemplate.htm`. This HTML file and the other Javascript, XML, CSS, and image files in `/wfs/localUI` are provided as a sample user interface that can be customized for your specific requirements. (To change the location of the UI, go to **Configuration > Video > Setup > Local UI Location**.) The window below shows the interface page (`stbLocalUITemplate.htm`) *after* it has been modified with stream data.

Figure 1. Sample Interface in Local Mode

Topics in this chapter

Accessing the XML Configuration File

The "configuration" file refers to the xml file (`/wfs/localUI/stbLocalUIData.xml`) that provides the list of streams available to the STB. This configuration file is used by `stbLocalUITemplate.htm` to populate the interface page. The xml file can be edited locally using a text editor (vi is included with the system) or it can be uploaded to a Windows desktop, modified with Notepad, and downloaded back to the STB. Once the file has been edited or created it must be installed on the STB. This is usually accomplished via FTP.

When editing the configuration file, do not use special characters or punctuation marks in any text strings; if used in the `Title`, `ProgramName`, `Message`, etc., the stream will not run. Also, be aware that it may take several seconds to write configuration changes to flash memory. To avoid problems, wait several seconds and do not reboot the STB until the **Transfer** LED on the front of the unit stops blinking.

▼ To access the command prompt and XML file:

1. Press **Ctrl**-**Alt**-**F1**.

2. Then cd (change directory) to the location: `/wfs/localui/`

Uploading from the STB

To FTP upload/download files from/to the STB (including the `stbLocalUIData.xml` configuration file), you can use Internet Explorer, another GUI based FTP client, or the command prompt FTP client using the following commands:

▼ To upload from the STB:

```
C:\> ftp 172.22.117.70
User (172.22.117.70:(none)): root
331 Password required for root.
Password: admin
230 User root logged in
ftp> bin
200 Type set to I.
ftp> cd /wfs/localui
250 CWD command successful.
ftp> get stbLocalUIData.xml
200 PORT command successful.
150 Opening BINARY mode data connection for ….
226 Transfer complete.
ftp> xxx bytes sent in 0.12 Seconds
ftp> bye
```

Downloading to the STB

▼ To download to the STB

```
C:\> ftp 172.22.117.70
User (172.22.117.70:(none)): root
331 Password required for root.
Password: admin
230 User root logged in
```

```
ftp> bin
200 Type set to I.
ftp> cd /wfs/localui
250 CWD command successful.
ftp> put stbLocalUIData.xml
200 PORT command successful.
150 Opening BINARY mode data connection for ...
226 Transfer complete.
ftp: 739 bytes sent in 0.12 Seconds
ftp> bye
```

XML Configuration Examples

The following examples show how to modify the xml configuration file (`/wfs/localUI/stbLocalUIData.xml`) for different media.

Title and Global Message Settings.

```
<?xml version="1.0"?>
<STBLocalUI>
<!-- this is general information -->
<Title>my STB Title</Title>
<GlobalMsg>Global Message</GlobalMsg>
<DefChannel>2</DefChannel>
</STBLocalUI>
```

Example of live MPEG-1 multi cast entry with IP address, port number, and channel number.

```
<!-- this is MPEG1 live stream -->
<Stream type="MPEG1">
<ProgramName>Sample MPEG1 stream</ProgramName>
<Message>BSB-MPEG1 stream</Message>
<Channel>1</Channel>
<IP>239.22.119.99</IP>
<Port>4444</Port>
</Stream>
```

Example of live MPEG-2 multicast entry with IP address, port number, and channel number.

```
<!-- this is MPEG2 live stream -->
<Stream type="MPEG2">
<ProgramName>Sample MPEG2 stream</ProgramName>
<Message>This is CNN.</Message>
<Channel>2</Channel>
<IP>239.16.120.3</IP>
<Port>4444</Port>
</Stream>
```

Example of live MPEG-4 multicast entry with SDP addressing information.

```
<!-- this is MPEG4 multicast live stream -->
<Stream type="SDP">
<ProgramName>MPEG4 multicast-remote SDP</ProgramName>
```

```
<Message>SDP file retrieved through HTTP</Message>
<SDP>http://239.22.133.3/vbs1d1.sdp</SDP>
</Stream>
```

Example of live MPEG-4 multicast entry with local SDP addressing information.

```
<!-- this is MPEG4 multicast live stream with SDP file stored locally-->
<Stream type="SDP">
<ProgramName>MPEG4 multicast-local SDP</ProgramName>
<Message>SDP file stored locally</Message>
<SDP>file:///wfs/mpg/mySDP.sdp</SDP>
</Stream>
```

Example of live MPEG-4 unicast entry with local SDP addressing information. Encoder must be configured to unicast to STB's IP adress.

```
<!-- this is MPEG4 unicast live stream with SDP file stored locally-->
<Stream type="SDP">
<ProgramName>MPEG4 unicast-local SDP</ProgramName>
<Message>SDP file stored locally</Message>
<SDP>file:///wfs/mpg/mySDP.sdp</SDP>
</Stream>
```

Example of live MPEG-4 stream with forced UDP streaming.

```
<!-- this is an MPEG4 rtsp stream (force UDP streaming)-->
<Stream type="RTSP4">
<ProgramName>MPEG4 RTSP (UDP)</ProgramName>
<Message>Sample MPEG4 RTSP (UDP streaming)</Message>
<Channel>3</Channel>
<IP>172.22.133.5</IP>
<RTSPName>vbrickvideo1</RTSPName>
</Stream>
```

Example of MPEG-4 RTSP stream with forced RTSP interleaved (TCP) streaming.

```
<!-- this is MPEG4 rtsp stream (force RTSP interleaved(TCP) streaming)-->
<Stream type="RTSP4_TCP">
<ProgramName>MPEG4 RTSP (TCP)</ProgramName>
<Message>Sample MPEG4 RTSP (Interleaved streaming)</Message>
<Channel>4</Channel>
<IP>172.22.133.5</IP>
<RTSPName>vbrickvideo1</RTSPName>
</Stream>
```

Example of MPEG-4 RTSP stream with Auto selection streaming.

```
<!-- this is an MPEG4 rtsp stream (Automatic selection streaming)-->
<Stream type="RTSP4_AUTO">
<ProgramName>MPEG4 RTSP (AUTO)</ProgramName>
<Message>Sample MPEG4 RTSP (Automatic streaming)</Message>
<Channel>5</Channel>
```

```
<IP>172.22.133.5</IP>
<RTSPName>vbrickvideo1</RTSPName>
</Stream>
```

Example of MPEG-1 unicast entry with port address.

```
<!-- this is MPEG1 Unicast stream -->
<Stream type="UNICAST_MPEG1">
<ProgramName>Sample MPEG1 Unicast</ProgramName>
<Message>Sample MPEG1 Unicast stream</Message>
<Port>5555</Port>
</Stream>
```

Example of MPEG-2 unicast entry with port address.

```
<!-- this is MPEG2 Unicast stream -->
<Stream type="UNICAST_MPEG2_TRANSPORT">
<ProgramName>Sample MPEG2 Transport Unicast</ProgramName>
<Message>Sample MPEG2 Transport Unicast stream</Message>
<Port>4444</Port>
</Stream>
```

Example of MPEG-1 content from NXG server with IP address and program name.

```
<!-- this is VoD content from MPEG1 -->
<Stream type="VOD1">
<VODServer>172.22.119.118</VODServer> <!--vod server ip address or hostname-->
<ProgramName>MP1_RONIN</ProgramName><!-- vod content name -->
<Message>MPEG1 content on 172.22.119.118</Message> <!-- local message -->
<Location>Complete-Movies</Location> <!--fullpath for vod content location -->
<Duration>1hr59min56sec</Duration> <!-- vod content duration -->
<Keyword>MPEG1 stream</Keyword> <!-- vod content keyword -->
</Stream>
```

Example of RTSP MPEG-2 content from NXG server with IP address and program name.

```
<!-- this is VoD content from MPEG2 -->
<Stream type="VOD2">
<VODServer>172.22.119.118</VODServer> <!--vod server ip address or hostname-->
<ProgramName>LOTR-The-Two-Towers</ProgramName> <!-- vod content name -->
<Location>Complete-Movies</Location> <!--full path for vod content location-->
<Message>MPEG2 content on 172.22.119.118</Message> <!-- local message -->
<Duration>2hrs52mins30sec</Duration> <!-- vod content duration -->
<Keyword>MPEG2 stream</Keyword> <!-- vod content keyword -->
</Stream>
```

Example of MPEG-4 content from NXG server with IP address and program name.

```
<!-- this is VoD content from MPEG4 -->
<Stream type="VOD4">
<VODServer>172.22.119.118</VODServer> <!--vod server ip address or hostname-->
<ProgramName>Bad-Boys-2-V1</ProgramName> <!-- vod content name -->
```

```
<Location>Complete-Movies</Location> <!--full path for vod content location-->
<Message>MPEG4 content on 172.22.119.118</Message><!--local message-->
<Duration>2hr26mins58sec</Duration> <!-- vod content duration -->
<Keyword>MPEG4 stream</Keyword> <!-- vod content keyword -->
</Stream>
```

Example of MPEG-1 content from VoD-W server with IP address and program name.

```
<!-- this is VoD content (MPEG1) from Infovalue -->
<Stream type="VOD1I">
<VODServer>172.17.17.5</VODServer> <!-- vod server ip address or host name -->
<ProgramName>MPEG-1InfovalueVODfile</ProgramName> <!-- vod content name -->
<Message>MPEG1 content on Infovalue</Message>     <!-- local message -->
<Location>/</Location> <!-- full path for vod content location -->
<Duration>1h 59m 56s</Duration> <!-- vod content duration -->
<Keyword>Mp1 stream</Keyword> <!-- vod content keyword -->
</Stream>
```

Example of MPEG-2 content from VoD-W server with IP address and program name.

```
<!-- this is VoD content (MPEG2) from Infovalue -->
<Stream type="VOD2I">
<VODServer>172.17.17.5</VODServer> <!-- vod server ip address or host name -->
<ProgramName>MPEG-2InfovalueVODfile</ProgramName> <!-- vod content name -->
<Location>/</Location> <!-- full path for vod content location -->
<Message>MPEG2 content on Infovalue</Message>     <!-- local message -->
<Duration>1h 0m 0s</Duration>                     <!-- vod content duration -->
<Keyword>Mp2 stream</Keyword>                      <!-- vod content keyword -->
</Stream>
```

Example of MPEG-4 content from VoD-W server with IP address and program name.

```
<!-- this is VoD content from MPEG4 -->
<Stream type="VOD4">
<VODServer>172.17.17.5</VODServer> <!-- vod server ip address or host name -->
<ProgramName>MPEG-4InfovalueVODfile</ProgramName> <!-- vod content name -->
<Location>Complete-Movies</Location><!-- full path for vod content location-->
<Message>MPEG4 content on Infovalue</Message>     <!-- local message -->
<Duration>2h 26m 58s</Duration>                   <!-- vod content duration -->
<Keyword>Mp4 stream</Keyword>                      <!-- vod content keyword -->
</Stream>
```

Chapter 4

System Upgrade

Topics in this chapter

Upgrading from v3.71 or Higher

Note   If you are upgrading from version 3.7.1 or higher, it is recommended that you use the following procedure to update the set top box. You can use the procedure described elsewhere for older versions but this method is faster and easier.

STB upgrades for set top boxes running v 3.7.1 and higher are performed using the standalone VBrick download application **ETV-STBDownload**. With **ETV-STBDownload**, you can (1) upgrade a single unit, (2) you can upgrade multiple units in your network using management SAPs, or (3) you can upgrade multiple units in your network using a manually-created configuration file. In a typical scenario, you use the setup program provided by VBrick to (1) install the STB software on an upgrade server and (2) to install the download application on the same PC or a different PC.

The STB software is installed locally (usually on a machine with ETV Portal Server) and then uploaded to target STBs using the download application. It is important to note that the download application needs an FTP server to upload files. An FTP server must be running on the computer where the release files are located. It can be a third-party FTP server, the FTP server installed with ETV Portal Server, or the FTP server installed with IIS. For this reason you may wish to install the application on a machine that is hosting ETV Portal Server (or on any machine that has IIS installed). If necessary, you can install the download application first and then configure a remote FTP server later.
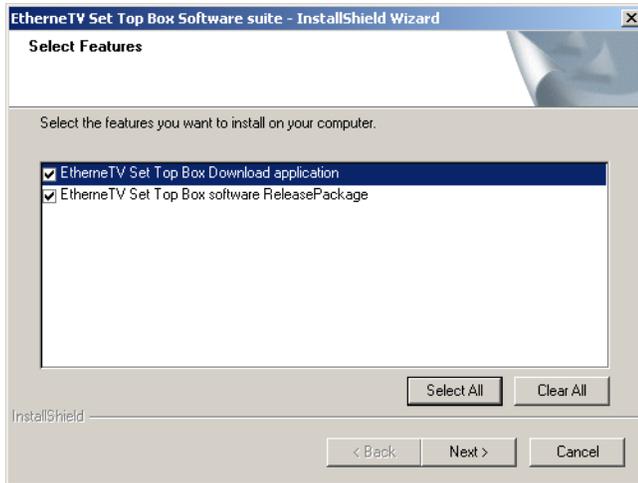
Installing the Download Application

You can have multiple Set Top Box software release packages installed on the same server. Each release is installed in the default location in a separate folder. You can install the download application and the software release files on the same machine, or on different machines. During installation, you are prompted to install the STB software, the upgrade application, or both. The STB software release and the download application can be installed on any computer running Windows 2000 or higher.

Note   You will need the installation disks for your operating system if you do not already have an FTP server installed.

▼ To install STB software and/or the download application:

1. Double-click on `Setup_STB_x_x_x.exe` in the installer folder to launch the installer. Then click **Next** to continue.

2. Select the features you want to install: the **Download Application**, the **Release Package**, or both. Then click **Next**. (If you select only the **Download Application**, you will not be prompted to create an FTP user account as explained below.)

3. Select an installation folder for the **Download Application** and click **Next**. The default is `C:\Program Files\VBrick\`.
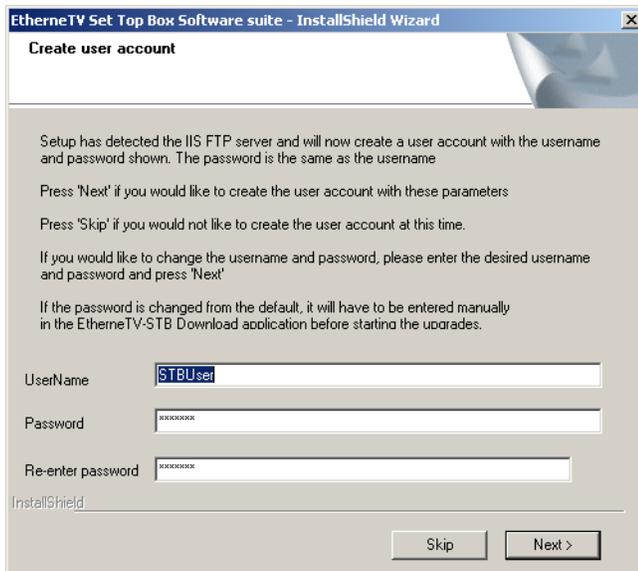
4. In this scenario, the installer has detected an FTP server and will create a user account. **STBUser** is the default name and password for the FTP account. (If you change the default user or password, you will have to enter them manually each time you run a download.) Press **Next**, confirm, and press **Next** again (or **Skip** this step entirely if you do not want to create an FTP account at this time). Note that if an FTP server is not currently installed on the server machine, you may be prompted for the installation disk.

5. Select a destination folder for the **Release Package** and click **Next**. The default is `c:\inetpub\ftproot\STBUser\Releasexxxx`. (All Release Packages have incremental numbers in separate folders.)

6. Click **Finish** when done.

7. Navigate to **Start > All Programs > VBrick > ETV-STBDownload** to launch the download application. On Windows XP, if the download application is blocked and will not launch, you may need to turn off the Windows Firewall before launching the application. Go to **Start > Control Panel > Windows Firewall**.

Before You Begin

Before you begin an upgrade, be aware of the following considerations:

- If the **Release Package** files (typically in `c:\inetpub\ftproot\STBUser\Releasexxx`) are installed on a computer running Windows XP, you must turn off the **Windows Firewall** while running the upgrade. Otherwise the upgrade will fail.

- The download application needs an FTP server running on the computer where the release files are located. It can be a third-party FTP server, the FTP server installed with ETV Portal Server, or the FTP server installed with IIS. If you are using the FTP server installed with IIS and the IP address changes for any reason, make sure you reconfigure the *new* IP address in IIS.

Running ETV-STBDownload

STB upgrades for set top boxes running v 3.7.1 and higher are performed using the standalone VBrick download application **ETV-STBDownload**. With **ETV-STBDownload**, you can (1) upgrade a single unit, (2) you can upgrade multiple units in your network using management SAPs, or (3) you can upgrade multiple units in your network using a manually-created configuration file. Set top boxes running software version 3.7.1 or higher emit management SAPs. These SAPs identify the presence (and revision level) of all set top boxes on the network (see Table 1, SAP Information). If you are upgrading multiple STBs, it will generally take several minutes to upgrade each STB so plan accordingly. Important: *When selecting set top boxes by IP address, be sure to click in the left column—not on the IP address.* Use **Ctrl + Click** and **Shft + Click** to select multiple units.

▼ To upgrade one or more STBs using ETV-STBDownload:

1. Be sure all STBs are powered on.

2. Select an **Upgrade preference**. There are three ways to upgrade your set top boxes.

   a. If you select **Upgrade using management SAPs**, the list is auto-populated. Simply select the units to upgrade and click **Start Upgrade**.

   b. If you select **Upgrade using Configuration file**, browse to a configuration file, select the units to upgrade and click **Start Upgrade**.

   c. If you select **Upgrade individual unit**, click **Start Upgrade** and enter the IP address and password of the unit to upgrade. Click **OK** to start.

IP Address	IP address of upgrade server where the Release Package files are located.
Username	Name of FTP account on the upgrade server.
Password	Password used to login to the FTP server.
Path	The relative path to the folder in which Release Package files are located. Enter a relative path for the configured username. *Do not enter an absolute path.* (Note that the Release Packages are numbered incrementally in separate folders.)
Upgrade using management SAPs	Upgrade using the SAP (Session Announcement Protocol) emitted by the STB. This automatically populates the list box with all available set top boxes. Select individual units and click **Start Upgrade**. Note that all STBs must have the same password. If some are different, the upgrade will fail with a message in the **Status** column (see Table 1, SAP Information)

Upgrade using Configuration file	Upgrade using a text file that identifies the IP address and the password used to login to the set top box. This radio button activates the **Configuration File Path** field and you can **Browse** to a configuration file if available. A sample pipe-delimited configuration file is shown here:
	 `172.22.133.1|admin`
	 `172.22.133.2|admin`
	 `172.22.133.3|admin`

Upgrade individual unit		Upgrade a single unit. Select the radio button and click **Start Upgrade**. A popup will prompt for IP Address and Password and automatically run the upgrade. The password is variable; the username (`root`) is fixed and cannot be changed.
	Note that all STBs selected for upgrade must have the same password.	
Configuration File Path	Path to a pipe-delimited configuration file. See <u>Editing a Configuration File</u> on page 31.	
Select All	Selects all STBs in the list box.	
Clear All	De-selects all STBs in the list box.	
Start Upgrade	Starts an upgrade after you selects units to upgrade.	

The following table shows the SAP information displayed in the list box for each set top box when you select **Upgrade using Management SAPs**.

Table 1. SAP Information

IP Address	Set top box IP address.
Hostname	The VBrick hostname set in the Configuration: Ethernet > Management page.
Group	The group name the STB is associated with on the Configuration: Network > Management page.
Unit	The Unit Number of the STB on the Configuration: Network > Management page.
Model Number	Set top box hardware model number.
Revision	Set top box software revision level.
Status	Upgrade status, for example, not started, in progress, failed, unable to connect, etc.

Once an upgrade starts, do not close the application until the status of all initiated upgrades changes to `Upgrade not needed`, `Upgrade successful` or `Upgrade failed`. If you close the application too soon, the status of some units may not display correctly when the application restarts. These units may include those which had errors during the upgrade process. The application can be safely closed after the status of all units has been resolved and you have corrected any errors.

Editing a Configuration File

You can use a configuration file to identify the units you want to upgrade. A configuration file is a pipe-delimited text file that identifies the IP addresses and the password used to login to the set top boxes. (When upgrading with a configuration file, each set top box can have a

different password.) A sample pipe-delimited configuration file is shown below. You can create a valid configuration file from a text file by giving it a `.cfg` extension.

```
172.22.133.1|admin
172.22.133.2|admin
172.22.133.3|admin
172.22.133.4|admin
```

▼ To edit an existing configuration file:

1. Select **Upgrade using Configuration file**.
2. **Browse** to an existing configuration file and click **Open** to populate the list box.
3. Go to **File > Edit Config File** and use any of the controls to edit the list.
4. Click **Save** when done.

IP Address	Set top box IP address to be added. Click **Add Set Top Box to Config File** to add IP address to list box.
Password	Password used to login to the set top box.
Path	Enter complete path or use **Browse** to select an existing configuration (`.cfg`) file. This file will be written to disk when you click **Save**.
Add Set Top Box to Config File	Adds specified set top box IP address to the configuration file and populates the list box.

Logging Upgrade Activities

The **ETV-STBDownload** application logs all commands and responses between the application and the upgrade server, and between the application and the set top boxes. To enable/disable application logging, go to **Preferences > Logging**. For debugging purposes, the log file records all error codes, success codes, checksums, etc. Since each new upgrade overwrites the log, be sure to check the log file (and save if necessary) after a failed upgrade. The `log.txt` file is saved by default in: `C:\Program Files\VBrick\ETV-STBDownload`.

Upgrading from v3.70 or Lower

The upgrade process described here is a two-step process. First you need to create an FTP server with IIS; then you can actually run the update using a web browser. Also, if you are using Local mode, you will need to perform the <u>Additional Upgrade Steps for Local Mode</u> on page 35.

Note   If you are upgrading from version 3.7.0 or lower, you must use the following procedure to update the set top box. You *cannot* use the procedure described elsewhere for newer versions of the software.

Creating an FTP Server with IIS

In order to update the set top box code, set up an FTP server in Microsoft IIS to allow the set top box to retrieve the update files. This example uses the Windows 2000 Operating System. If using a different Microsoft operating system, refer to the appropriate documentation for details. Other Linux and UNIX-based FTP servers work equally well.

▼   To perform a system update using the IIS FTP server:

1.   Go to **Start > Programs > Administrative Tools >Internet Services Manager**. Then select from the tree to view selections as described below.

2.   Use the right mouse button to select **Default FTP Site**.

3.   Select the **FTP Site** tab.

4.   Set the IP Address.

5.   Select **Home Directory** tab.

6.   Set **Directory Listing Style** to **Unix**. Do not use an @ character in the FTP password.

7.   Set the **Local Path** to the FTP home directory. This corresponds to the folder in the specified location (for example `c:\inetpub\ftproot`).

8.   Create a subdirectory for the upgrade files in the specified location: Copy the zipped upgrade to the specified folder (for example, `c:\inetpub\ftproot\etvstb.37xx`).

9.   Extract the release files from `ETV_STB_3_7_xx.tar.gz` in the subdirectory created above. For Windows-based systems, you can use a utility like WinZip. For Unix and Linux systems, put the above file in the chosen subdirectory and type:

```
tar xvzf ETV_STB_3_7_xx.tar.gz
```

Using a Web Browser to Run the Update

Make sure the set top box has a valid IP Address before performing an upgrade. (See <u>Setting the IP Address</u> on page 4; in the STB configuration program, go to **Configuration > Network > Ethernet > IP Address**.)

▼   To perform a system update using a web browser:

1.   Launch a web browser, such as Internet Explorer, and point it to the internal web server on the set top box, for example `http://172.16.135.50` This launches the STB **Administration** program.
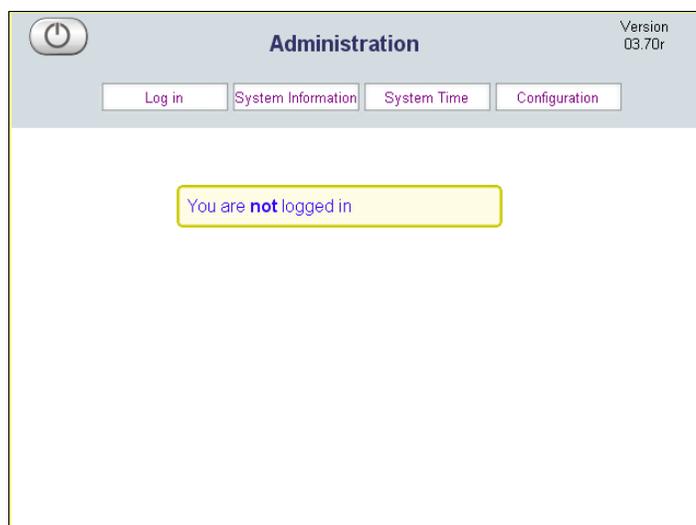
2. Select **Login** and enter the username and password (the defaults are `root` and `admin`).

3. Go to **Configuration > General > System Update.**

4. Select **FTP Server** and enter an IP Address.

5. Select **Relative Directory Path** and enter the path on the FTP server where the upgrade files are located. This field corresponds to the Home Directory set in the Default FTP Site Properties. This is a relative directory path and cannot start with a slash.

   For example, if the login directory of the FTP user is `C:\inetpub\ftproot` and the directory containing the upgrade is `C:\inetpub\ftproot\etvstb.37xx`, enter `etvstb.37xx` in this field.

6. If not set, set the FTP username and password to match the FTP location username and password. Do not use @ character in the password.

7. Click **Apply** and the set top box will perform a partial reset. Wait until the Home page displays before continuing to the next step.

8. Select **Exit** from the STB Configuration menu on the PC.

9. Go to **System Update** and click **Update**.

10. From the set top box, use the keyboard and enter **Ctrl-Alt-F5** to view the upgrade process. Total upgrade time is approximately 8 – 10 minutes. When done, the STB will automatically reset to the Home page.

Removing Lock Files

A system update may fail because a "lock" file was detected from a previous update. A lock file will prevent any subsequent system updates from being successful.

▼ To remove a lock file:

1. Open a Command Prompt window (see <u>Using the Command Prompt</u> on page 2).

2. Press **Ctrl-Alt-F1** (or **Ctrl-L** and **Enter** if necessary to view the command prompt on a television).

3. Type `cd /var/lock`

4. Type `ls` to view the list of lock files.

5. Type `rm systemupdate.LCK` (using the appropriate file name).

6. If only one file is present, just type `rm <file name>`.

Verifying the File Transfer

There are two ways to indicate the progress of the transfer. Once the update is complete, the Web Administration program shows the version number in the upper right corner. You can also verify file transfer success using the command prompt:

▼ To check the version number using the command prompt:

1. Press **Ctrl-Alt-F1** on the set top box.
2. Type `tasteversion` to display the version number.
3. Press **Ctrl-Alt-F2** to return to the STB user interface.

Additional Upgrade Steps for Local Mode

The **Local** mode user interface may have been customized at your site and the upgrade process does not overwrite the local user interface in order to save your changes. If you use the local user interface provided by VBrick, and are upgrading an existing set top box, the system update will not be complete until you perform the following steps.

▼ To activate all new **Local** user interface features and functionality, you must perform the following steps <u>after</u> you finish the upgrade as described above.

1. Gain access to a shell on the box using one of the following methods.
   a. **Ctrl-Alt-F1** from the keyboard;
   b. The serial shell;
   c. Telnet.
2. If you want to preserve changes made to the user interface in **Local** mode, move the files you have changed (most likely XM and HTM files) to the `/wfs` directory from the `/wfs/localui` directory. For example: `mv /wfs/localui/stbLocalUIData.xml /wfs`
3. Execute the following command **rm –rf /wfs/localui**
4. Reboot STB by typing **reboot –f**

   If you <u>did not</u> move any files in Step 2 above, you are done. If you <u>did</u> move files in Step 2 above, continue with the following steps.
5. Since you may have lost the shell on reboot, regain shell access.
6. Note that the `/wfs/localui` directory once again exists.
7. For each file moved to `/wfs` in Step 2 above, move the equivalent file now in `/wfs/localui` to its name with a `_build37xx` suffix added. These files can be examined for model code on how to implement new features. For example:

   `mv /wfs/localui/stbLocalUIData.xml /wfs/localui/stbLocalUIData.xml_build37xx`
8. For each file moved to `/wfs` in Step 2 above, move it back into the `/wfs/localui` directory. For example: `mv /wfs/stbLocalUIData.xml /wfs/localui`

Serial Port Passthrough

Overview

Using serial port passthrough, STBs can provide full duplex, end-to-end transparent passthrough of user data from an STB to a VBrick, or to other networked devices. The STB has one serial port that can be used for passthrough. The serial port operates at its configured baud rate (e.g. 300 to 115.2 Kbps). Some common applications include remote control of a camera (pan-tilt-zoom), remote control of security doors, low speed data transport, or data collaboration between PCs. *Note that passthrough mode is used to send control information from an STB to/from another device and may not support sustained data at higher data rates.*
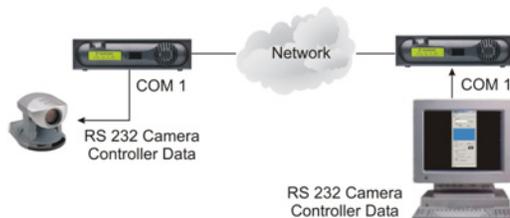
Topics in this chapter

How Passthrough Works

VBrick STBs can receive data on a particular TCP/IP port and transparently output that data to a serial port. Conversely, any data input to a serial port can be *passed through* to other devices connected to that TCP/IP port. Devices include VBrick appliances or special applications connected to the appropriate TCP/IP port. This feature is called "Serial Port Passthrough." The serial port is assigned port TCP 4439. A typical application is for two VBricks connected to each other's TCP/IP port 4439. In this case, characters typed into a terminal program attached to one VBrick's serial port appear on a terminal program attached to the other VBrick's serial port. In this case, the TCP/IP network serves as an intermediary between the serial ports of two VBrick appliances.

An STB is a Responder of passthrough connections. When configured as a responder it will accept up to 64 connections from initiator appliances. It is possible to Disable Passthrough Mode, so that the STB cannot respond to Passthrough requests. Since the medium used for setting up Passthrough connections is a generic TCP/IP port, any IP device that is prepared to connect to a VBrick's port can be considered as a Passthrough Initiator. The VBrick Responder appliance will not know the exact nature of the device at the other end of the port.

For example, a generic Telnet client configured to connect to an STB on port 4439 will cause the STB to start sending data from it's serial port, using the connection it accepted from the Telnet client.

Note   Once a Passthrough connection is established, the actual flow of data is symmetric between the ends of the connection. That is, the behavior of the serial ports with respect to typed characters will appear to be the same at both ends, Initiator and Responder.

Serial Port Pinouts

The serial port on the STB can be used for device management or for the passthrough responder feature. The pinouts on the serial port are listed below:

Pin	Function
1	N/A
2	RD - Receive Data
3	TD – Transmit Data
4	DTR – Data Terminal Ready
5	Ground
6	DSR – Data Set Ready, not used
7	RTS – Request to Send
8	CTS – Clear to Send, not used
9	N/A

The RTS and DTR pins can be configured to be always asserted, never asserted, or "auto." When configured for auto, the control leads are asserted when a passthrough initiator has established a connection to the passthrough port and de-asserted otherwise. The STB does not use hardware flow control, so pins 6 and 8 (DSR and CTS) are not used. A null modem DB9 cable (not included) with two female connectors can be used to connect the STB's serial port to a PC.

Using Telnet

As noted, the serial port can be accessed over Ethernet via a Telnet client. An STB configured as a Passthrough Responder will accept a connection request to TCP port 4439. The request can come from a Telnet client or other PC application. Any data sent by the PC to TCP ports 4439 will be delivered out of the STB serial port and any data present on the STB serial port will be sent to the connected PC.

If multiple Telnet sessions are active on one STB (each STB supports up to 64 sessions), the data from the STB will be sent to all connected PC's, and the data received by the STB from the PCs will be delivered on the serial port. If multiple Telnet sessions are active and each is sending data to the STB, the data delivered by the RS-232 port will be a mix of characters presented in the order they were received (e.g. the data from all the senders is bridged

together). This feature provides a method to broadcast alarm status or other information to multiple locations.

Chapter 6
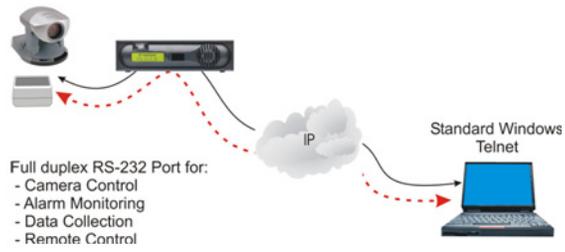
Using the Set Top Box

Overview

The look-and-feel of the STB screen depends on how it is configured. Once configured with an IP address and powered on, the set top box opens in one of three **Start** modes depending on how it is set to operate. Each **Start** mode has a different "start" page that is displayed at startup. To configure **Start** mode in the STB configuration application, go to **Configuration > Video > Setup > Start Mode**.

Start Mode	Description
Local	In **Local** start mode, the start page shows all live streams and videos that are available for viewing. This page is created and programmed by a system administrator and can be customized or re-created with any look-and-feel appropriate for your site. Any live streams or videos are pre-programmed in advance. See Local Configuration on page 21 for details.
Local-Fullscreen	In **Local-Fullscreen** start mode, the STB is programmed to display a single stream or a video. It can only be changed by a system administrator. There are no user controls except **Volume** and **Mute**.
MCS	In **MCS** start mode, the start page is downloaded from a VBrick ETV Portal Server (formerly MCS). The live streams and videos displayed on the STB are configured in the Portal Server. See the *ETV Portal Server Administrator Guide* and the *ETV Portal Server User Guide* for more about how to configure and use the ETV Portal Server.

Topics in this chapter

Start Mode

Local Mode

If the set top box is configured for **Local** mode, the start page (`stbLocalUITemplate.htm`) is stored locally in the STB. The content available on the page (links to either live streams or

stored videos) is determined and programmed by an administrator and downloaded to the STB (see Local Configuration on page 21 for more about how to create and download the configuration file). The page is hard-coded with links to different content. To change the available content, you need to modify and download a new page.
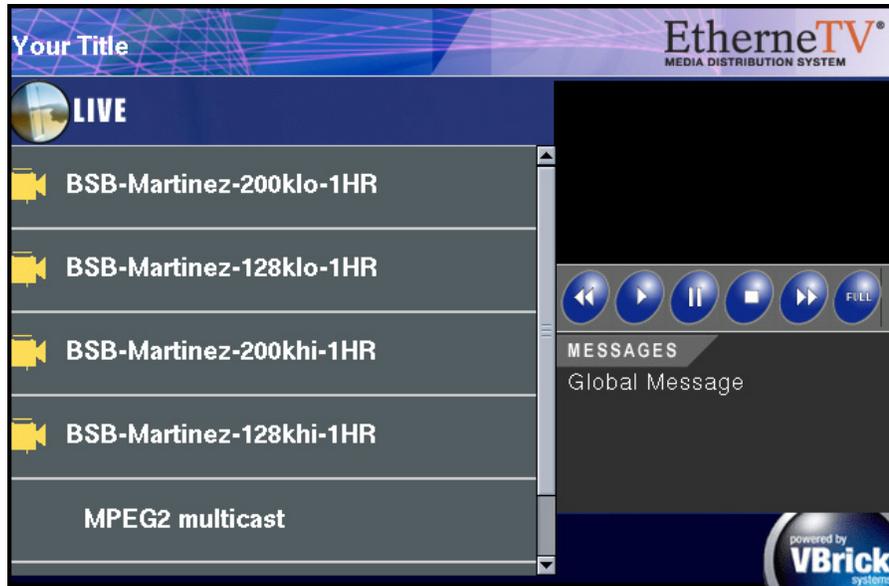

Figure 1. Local Mode

Local-Fullscreen Mode

If the set top box is set up in **Local-Fullscreen** mode, there will be a (live or stored) video image on the TV at system startup. The image is controlled by the system administrator. It covers the entire screen and there are no user controls shown or available. The video image is programmed to decode a specific stream. **Volume** and **Mute** are the only controls available from either the wireless keyboard or the IR handheld remote control.

Figure 2. Local-Fullscreen Mode

MCS Mode

In **MCS** start mode, the start page is downloaded from a VBrick Media Control System. The live streams and videos displayed on the STB are configured in the ETV Portal Server (formerly MCS). In **MCS** mode, the STB has optional login authentication to protect against unauthorized use. If authentication is enabled, the STB will display a login window when powered on for the first time. You must use the IR remote control (or the wireless keyboard) to enter a PIN. PIN numbers are configured in ETV Portal Server. Once logged in, the set top box displays a home page. The home page resides on the ETV Portal Server as an HTML page and is uploaded to the STB at startup (the ETV Portal Server is a web server). The home page is dynamically updated with a list of live streams or stored videos. *See the ETV Portal Server Administrator Guide* for complete details.

Note   The VBrick ETV Portal Server (formerly MCS) is outside the scope of this document. For more about how to configure and use the portal server, see the *ETV Portal Server Administrator Guide* and the *ETV Portal Server User Guide* respectively.
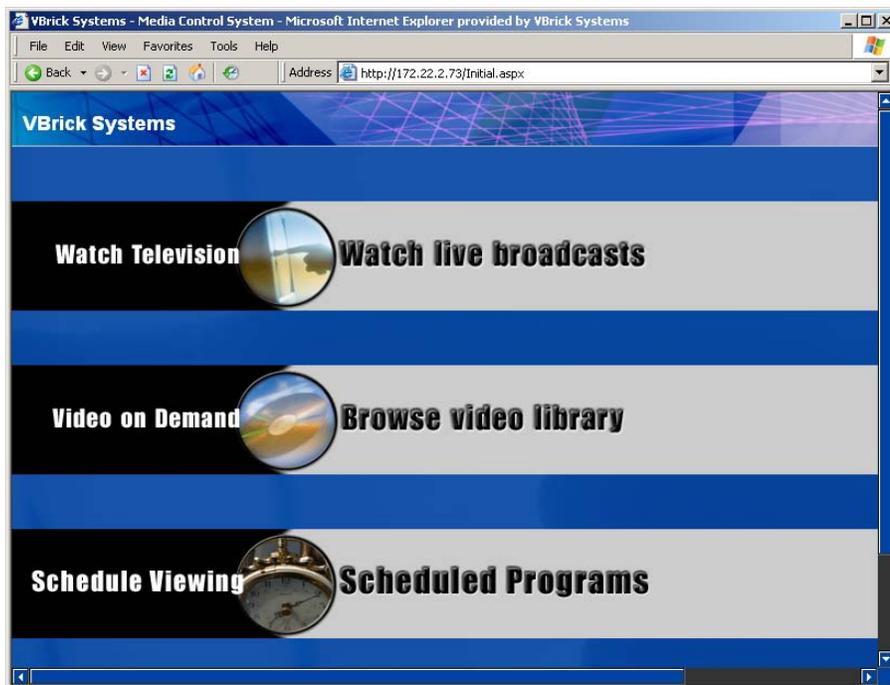
Figure 3. MCS Mode

Using the IR Remote

The remote control unit is an infrared remote control device you point at the sensor *on the front of the STB above the LEDs.* As described below, the buttons on the remote control only work if the STB is configured for **MCS** or **Local** mode. If configured for **Local-Fullscreen**, you can only use the **Volume** and **Mute** buttons. See <u>Start Mode</u> on page 10 for more information. The buttons on the handheld IR remote control are described in the following table from left to right and top to bottom.

Note	If playing a file on an NXG VOD server in Local mode, the **Play** button on the IR remote will start (or re-start) the video from the beginning. For best results, use the **Channel** and **Select** buttons rather than the mouse controls.

Stop, Play, Pause	Once a stream is selected, the buttons across the top can be used to stop, play, or pause a video. Stop and pause are useful when playing VoD streams.
Power	Power the STB on or off.
Begin/End	The outer buttons on the second row are not used.
Fast Forward/ Rewind	The middle buttons on the second row are used with VoD to go **Fast Forward** or **Rewind** MPEG-1 and MPEG-2 videos; not supported with MPEG-4.
Left Mouse Button	Green. Corresponds to left mouse button.
Cursor Pad	Press circular pad to move the cursor in the same manner as you move a mouse.
Right Mouse Button	Black. Not used.
Help	Not used.
Up/Down Arrows	Page up and down menus.
Info	Provides useful information about a live stream or a video in progress. MCS Start Mode only.
Mute	Mute/un-mute the sound.
Select	Yellow. Selects the currently highlighted stream or menu selection.
Volume	Adjust volume up or down.
Full Screen	Press for Full Screen; press again to close.
Channel	Press up or down to page through streams or videos.
TV	Opens Watch Television page. MCS Start Mode only.
WWW	Launches a web browser if enabled.
VOD	Opens Video on Demand page. MCS Start Mode only.
0 – 9	Use to enter a PIN if security is enabled.
Record	Red. Press once to start recording if ETV Portal Server and video-on-demand servers are present; press again to stop recording.
Menu	Displays the Menu commands.

# Using the Wireless Keyboard

The wireless keyboard is an optional device. It has an infrared transmitter you point at the sensor *on the front of the STB above the LEDs*. It is easy to use the wireless keyboard for any

STB operation like navigation, selecting streams, etc. It has all of the handheld IR controls (see above) as well as a full QWERTY keyboard with a mouse pad on the right and mouse buttons on the left. The wireless keyboard is available from VBrick. When using a *standard* keyboard, it also helps to connect a standard (USB or PS/2) mouse to the STB. Once attached, go to **General > Hardware > Mouse Type** to configure the STB for the mouse you are using. Note that the STB has one PS/2 port and two USB ports.

Accessing the Web

The WWW feature requires a keyboard and operates in MCS and Local mode only. Attach a standard (USB or PS/2) keyboard or use the wireless keyboard available from VBrick Systems. (When using a standard keyboard, it also helps to connect a mouse. To configure a mouse, go to **General > Hardware > Mouse Type**.) The **WWW** feature must be enabled in STB configuration. To check, go to **Configuration > General>Security>Enable Browsing**. If browsing is enabled, select the **WWW** button on the keyboard or on the IR remote to launch an Internet browser.

When you select **WWW**, a browser address bar is displayed at the top left of the window with navigation buttons on the right. Enter a web location (either an IP address or URL) in the box provided. Use the IR remote control or wireless keyboard mouse to position the cursor at the beginning or end of the text string and enter a location with the keyboard. Use **Delete** or **Backspace** to erase. The browser navigation buttons are described below from left to right.
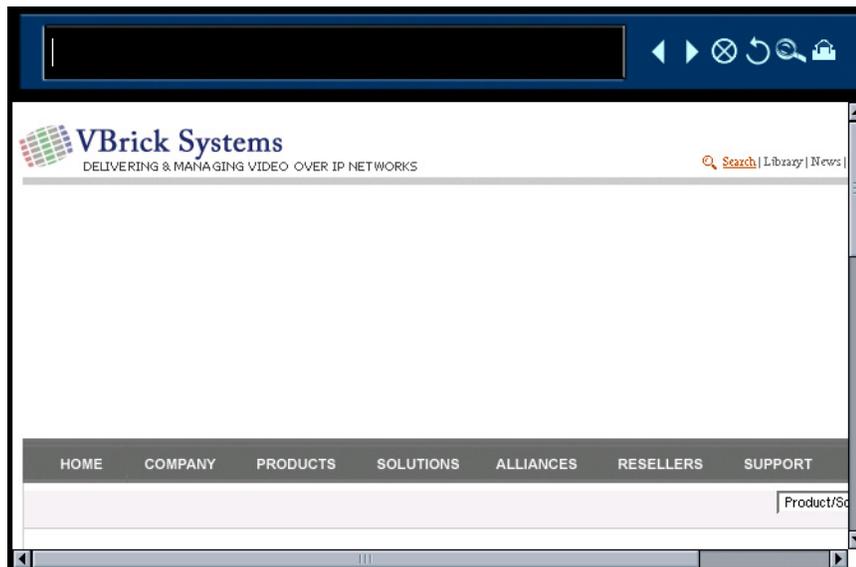
Icon	Description
Back	Move back one page.
Forward	Move forward one page.
Stop	Stops the current operation, for example a page download.
Refresh	reloads the current page.
Search	Launches a search window, for example Google.

Icon	Description
Home	Local and MCS mode only. Exits to the home page. In Local mode, it exits to the local home page; in MCS mode, it exits to the MCS home page. *After returning to the normal STB user interface, press WWW again to hide the browser address bar.*

Index

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V

W

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